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SEARCH REQUEST FORM

Requester's Full Name: BEN JACKLEY Examiner #: 73489 Date: 8/21/06  
Art Unit: 1626 Phone Number: 2-0704 Serial Number: 10/759,384  
Location (Bldg/Room#): REM5B31 (Mailbox #): \_\_\_\_\_ Results Format Preferred (circle): PAPER DISK  
\*\*\*\*\*

To ensure an efficient and quality search, please attach a copy of the cover sheet, claims, and abstract or fill out the following:

Title of Invention: Catalyst for selective oxidation & ammoxidation of alkenes and/or alkanes  
Inventors (please provide full names): Nieto et al

Earliest Priority Date: 07/16/02

Search Topic:

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc., if known.

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

A catalyst for selective and ammoxidation of alkenes and/or alkanes for preparing acrylic acid, acrylonitrile comprising catalyst of formula  $MoTeVAdA$ , where A is selected from Nb, Ta, Sn, Se, W, Ti, Fe, Co, Ni, Cu, and a rare earth which also comprises Cu, where Mo, Te, V and Cu are present in the form of an oxide, wherein the calcined catalyst has diffraction angles of  $2\theta$  at  $22.1 \pm 0.4$ ,  $27.1 \pm 0.4$ ,  $28.1 \pm 0.4$ ,  $36.0 \pm 0.4$  and  $45.1 \pm 0.4$

SCIENTIFIC REFERENCE-BR  
Sci. & Tech. Inf. Ctr.

AUG 2 2006

Pat. & T.M. Office

Thanks

(This type of data is unlikely to be mentioned in an online abstract - probably only the full publication or patent might have such data.)

EE

8-23-06

=> FILE REG

FILE 'REGISTRY' ENTERED AT 12:27:19 ON 23 AUG 2006  
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=> D HIS

FILE 'LREGISTRY' ENTERED AT 12:08:04 ON 23 AUG 2006

L1 0 S (MO(L)TE(L)V(L)CU(L)O)/ELS  
L2 0 S L1 (L) ((NB OR TA OR SN OR SE OR W OR TI OR FE OR CO OR

FILE 'HCAPLUS' ENTERED AT 12:11:20 ON 23 AUG 2006

L3 121 S LOPEZ NIETO ?/AU  
L4 475 S BOTELLA ?/AU  
L5 154 S SOLSONA ?/AU  
L6 8 S L3 AND L4 AND L5  
SEL L6 4 RN

FILE 'REGISTRY' ENTERED AT 12:18:57 ON 23 AUG 2006

L7 11 S E1-E11  
L8 31 S (MO(L)TE(L)V(L)CU(L)O)/ELS  
L9 26 S L8 (L) ((NB OR TA OR SN OR SE OR W OR TI OR FE OR CO OR  
L10 5 S L8 NOT L9

FILE 'CAOLD' ENTERED AT 12:23:17 ON 23 AUG 2006

L11 0 S L9  
L12 0 S L10

FILE 'ZCAPLUS' ENTERED AT 12:23:32 ON 23 AUG 2006

L13 26 S L9  
L14 5 S L10  
L15 3 S L13 AND L14  
L16 26 S L13 OR L15  
L17 2 S L14 NOT L16

=> FILE ZCAPLUS

FILE 'ZCAPLUS' ENTERED AT 12:27:36 ON 23 AUG 2006

USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.

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=> D L16 1-26 IBIB ABS HITSTR HITRN

L16 ANSWER 1 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1088269 ZCAPLUS

DOCUMENT NUMBER: 143:358990

TITLE: Composite polymetallic oxide catalyst and its preparation process

INVENTOR(S): Guo, Yaoxing; Zhu, Jinming; Jiang, Manli; Wei, Shujuan; Yang, Baiping; Niu, Xiaomei

PATENT ASSIGNEE(S): PetroChina Co., Ltd., Peop. Rep. China

SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 18 pp.

CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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CN 1445020	A	20031001	CN 2003-121882	20030417

PRIORITY APPLN. INFO.: CN 2003-121882

20030417

AB A composite polymetallic oxide catalyst for oxidn. of acrolein to acrylic acid is formulated as  $M_{0.5}V_bC_{0.5}T_{0.5}X_1eX_2fX_3gX_4hX_5iO_x$ , where  $X_1$  is from at least one of the W and Nb;  $X_2$  from at least one of the Mg, Ca, Si, and Ba;  $X_3$  from at least one of the Fe, Co, and Ni;  $X_4$  from at least one of the Si, Al, and Ti;  $X_5$  from at least one of the Sb, Sn, and Bi; and x is balance. The Ni source is from one of the basic  $NiCO_3$ , nickel acetate,  $Ni(NO_3)_2 \cdot 6H_2O$ , nickel oxalate, and  $NiO$ ; the

Si source from oxides or their sols; and the Sb source from at least one of the Sb acid, antimony oxalate, and Sb<sub>2</sub>O<sub>3</sub>. The catalyst shows good persistent activity and high selectivity.

IT 491596-18-0P 865812-56-2P 865812-57-3P  
865812-58-4P 865812-59-5P 865812-60-8P  
865812-61-9P 865812-62-0P

(prepn. of composite metal oxide catalysts for oxidn. of acrolein)

RN 491596-18-0 ZCAPLUS

CN Copper molybdenum tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cu	x	7440-50-8
Mo	x	7439-98-7

RN 865812-56-2 ZCAPLUS

CN Copper molybdenum strontium tellurium tungsten vanadium oxide (9CI)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cu	x	7440-50-8
W	x	7440-33-7
Sr	x	7440-24-6
Mo	x	7439-98-7

RN 865812-57-3 ZCAPLUS

CN Antimony copper molybdenum nickel silicon strontium tellurium  
tungsten vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
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O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cu	x	7440-50-8
Sb	x	7440-36-0
W	x	7440-33-7
Sr	x	7440-24-6
Si	x	7440-21-3
Ni	x	7440-02-0
Mo	x	7439-98-7

RN 865812-58-4 ZCAPLUS

CN Antimony copper molybdenum nickel silicon tellurium vanadium oxide  
(9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cu	x	7440-50-8
Sb	x	7440-36-0
Si	x	7440-21-3
Ni	x	7440-02-0
Mo	x	7439-98-7

RN 865812-59-5 ZCAPLUS

CN Barium copper molybdenum niobium tellurium vanadium oxide (9CI) (CA  
INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cu	x	7440-50-8
Ba	x	7440-39-3
Nb	x	7440-03-1
Mo	x	7439-98-7

RN 865812-60-8 ZCAPLUS

CN Antimony cobalt copper molybdenum nickel silicon strontium tellurium  
tungsten vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cu	x	7440-50-8
Co	x	7440-48-4
Sb	x	7440-36-0
W	x	7440-33-7
Sr	x	7440-24-6
Si	x	7440-21-3
Ni	x	7440-02-0
Mo	x	7439-98-7

RN 865812-61-9 ZCAPLUS

CN Aluminum antimony copper molybdenum nickel strontium tellurium  
titanium tungsten vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cu	x	7440-50-8
Sb	x	7440-36-0
W	x	7440-33-7
Ti	x	7440-32-6
Sr	x	7440-24-6
Ni	x	7440-02-0
Mo	x	7439-98-7
Al	x	7429-90-5

RN 865812-62-0 ZCAPLUS

CN Antimony copper molybdenum nickel silicon tellurium tungsten  
vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cu	x	7440-50-8
Sb	x	7440-36-0
W	x	7440-33-7
Si	x	7440-21-3
Ni	x	7440-02-0
Mo	x	7439-98-7

IT 491596-18-0P 865812-56-2P 865812-57-3P  
865812-58-4P 865812-59-5P 865812-60-8P  
865812-61-9P 865812-62-0P

(prepn. of composite metal oxide catalysts for oxidn. of  
acrolein)

L16 ANSWER 2 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1025652 ZCAPLUS

DOCUMENT NUMBER: 143:325783

TITLE: Production method of iron-antimony-tellurium  
metal oxide catalyst

INVENTOR(S): Miyaki, Kenichi; Watanabe, Seigo; Mizutani,  
Koichi

PATENT ASSIGNEE(S): Dia-Nitrix Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
JP 2005254058	A2	20050922	JP 2004-65848	200403 09
PRIORITY APPLN. INFO.:				200403

09

AB The invention refers to a prodn. method of a metal oxide catalyst contg. Fe, Sb and Te used for ammoxidn. reactions to form nitrile compds. wherein a soln. or slurry contg. the Fe raw material, Sb raw material and nitrate ions at pH < 7 is heated to 60° for 30 min, and the Te raw material is added in two batches, before and after the heating.

IT 865086-80-2 865086-82-4

(prodn. method of iron-antimony-tellurium metal oxide catalyst)

RN 865086-80-2 ZCAPLUS

CN Antimony copper iron molybdenum potassium tellurium tungsten vanadium zinc oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
Zn	x	7440-66-6
V	x	7440-62-2
Cu	x	7440-50-8
Sb	x	7440-36-0
W	x	7440-33-7
K	x	7440-09-7
Mo	x	7439-98-7
Fe	x	7439-89-6

RN 865086-82-4 ZCAPLUS

CN Antimony copper iron manganese molybdenum phosphorus tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Sb	x	7440-36-0
Mo	x	7439-98-7



Mn		x		7439-96-5
Fe		x		7439-89-6

IT 865086-80-2 865086-82-4

(prodn. method of iron-antimony-tellurium metal oxide catalyst)

L16 ANSWER 3 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:234899 ZCAPLUS

DOCUMENT NUMBER: 142:279661

TITLE: Production method of oxidation catalyst for  
synthesis of methacrylic acid

INVENTOR(S): Uda, Takashi; Naito, Hiroyuki

PATENT ASSIGNEE(S): Mitsubishi Rayon Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
JP 2005066476	A2	20050317	JP 2003-300213	200308 25
PRIORITY APPLN. INFO.:				JP 2003-300213 200308 25

OTHER SOURCE(S): CASREACT 142:279661

AB The invention refers to a prodn. method of an oxidn. catalyst for methacrylic acid synthesis  $\text{PaMobVcCudXeYfZgOh}$  [ $X = \text{Sb, Bi, As, Ge, Zr, Te, Ag, Se, Si, W}$  and/or  $B$ ;  $Y = \text{Fe, Zn, Cr, Mg, Ta, Co, Mn, Ba, Ga, Ce}$  and/or  $\text{La}$ ;  $Z = \text{K, Rb}$  and/or  $\text{Cs}$ ; if  $b = 12$  then  $a = 0.5 - 3$ ,  $c = 0.01 - 3$ ,  $d = 0.01 - 2$ ,  $e = 0 - 3$ ,  $f = 0 - 3$ ,  $g = 0.01 - 3$  and  $h =$  dependent on other elements] wherein a soln. A contg. Magneto-optical, P and V and having 0 - 1.5 mol of ammonium root for every 12 mol of Mo atoms is mixed with soln. C contg. element Z, and to this mixed soln. AC a 3rd soln. B contg. 6 - 17 mol of ammonium root for every 12 mol of Mo atoms in soln. A to form a mixed soln. ABC wherein 10% of the particles in the soln. have diam. 0.05 - 2.0

IT  $\mu$ m. The precursor is dried and calcined to produce the catalyst.  
847142-54-5 847142-55-6  
(prodn. method of oxidn. catalyst for synthesis of methacrylic acid)  
RN 847142-54-5 ZCAPLUS  
CN Cesium copper manganese molybdenum phosphorus tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Cs	x	7440-46-2
Mo	x	7439-98-7
Mn	x	7439-96-5

RN 847142-55-6 ZCAPLUS  
CN Cerium cesium copper molybdenum phosphorus tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Cs	x	7440-46-2
Ce	x	7440-45-1
Mo	x	7439-98-7

IT 847142-54-5 847142-55-6  
(prodn. method of oxidn. catalyst for synthesis of methacrylic acid)

DOCUMENT NUMBER: 141:139881  
 TITLE: Method for preserving catalyst used in synthesis  
 of methacrylic acid  
 INVENTOR(S): Taniguchi, Yoshiyuki; Kuroda, Toru; Takezawa,  
 Hideyasu; Kabu, Yasuhiro  
 PATENT ASSIGNEE(S): Mitsubishi Rayon Co., Ltd., Japan  
 SOURCE: PCT Int. Appl., 20 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004062798	A1	20040729	WO 2004-JP102	20040109
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ				
CN 1723085	A	20060118	CN 2004-80002012	20040109
US 2006128561	A1	20060615	US 2005-542018	20050711
PRIORITY APPLN. INFO.:			JP 2003-3115	A
			WO 2004-JP102	W
				20030109
				20040109

AB The invention refers to a method for preserving a catalyst, concerning a P-Mo-V catalyst contg. P, Mo and V in a continuous vapor phase oxidn. reaction to produce methacrylic acid from methacrolein, the P-Mo-V catalyst held in a reactor before the start

of a reaction or during the stop of the reaction is kept dry with a H<sub>2</sub>O content of 30 mg or less per 1 g of the catalyst. The method allows the prevention of the deterioration of the catalyst held in a reactor with ease and simplicity.

IT 155553-93-8, Antimony copper iron molybdenum phosphorus  
potassium tellurium vanadium oxide  
(method for preserving P-Mo-V catalyst used in synthesis of  
methacrylic acid)

RN 155553-93-8 ZCAPLUS

CN Antimony copper iron molybdenum phosphorus potassium tellurium  
vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Sb	x	7440-36-0
K	x	7440-09-7
Mo	x	7439-98-7
Fe	x	7439-89-6

IT 155553-93-8, Antimony copper iron molybdenum phosphorus  
potassium tellurium vanadium oxide  
(method for preserving P-Mo-V catalyst used in synthesis of  
methacrylic acid)

L16 ANSWER 5 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:76688 ZCAPLUS

DOCUMENT NUMBER: 138:122955

TITLE: Catalyst for the selective oxidation and  
ammoxidation of alkanes and/or alkenes to  
(meth)acrylic acid or acrylonitrile

INVENTOR(S): Lopez Nieto, Jose Manuel; Botella, Asuncion  
Pablo; Solsona, Espriu Benjamin

PATENT ASSIGNEE(S): Consejo Superior De Investigaciones Cientificas,  
Spain; Universidad Politecnica De Valencia

SOURCE: PCT Int. Appl., 38 pp.  
CODEN: PIXXD2

DOCUMENT TYPE: Patent  
 LANGUAGE: Spanish  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
WO 2003008096	A1	20030130	WO 2002-ES357	20020716
W: CA, JP, US RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				
ES 2181600	A1	20030216	ES 2001-1756	20010717
ES 2181600	B1	20040116		
EP 1473081	A1	20041103	EP 2002-748887	20020716
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR, BG, CZ, EE, SK				
JP 2004534650	T2	20041118	JP 2003-513694	20020716
US 2004230070	A1	20041118	US 2004-759384	20040116
PRIORITY APPLN. INFO.:				
			ES 2001-1756	A 20010717
			WO 2002-ES357	W 20020716

AB Catalysts for the selective oxidn. and ammoxidn. of alkanes and/or alkenes to acrylic acid, acrylonitrile, or their derivs. comprise at least one oxide, preferably a calcined mixed oxide of Mo, Te, V, Cu and at least one other compd. A which is selected from Nb, Ta, Sn, Se, W, Ti, Fe, Co, Ni, Cr, Ga, Sb, Bi, a rare earth, an alk. or

alk.-earth metal. In the calcined form, the X-ray diffractogram of the catalyst comprises five intense diffraction lines, typically the most intense, corresponding to diffraction angles  $2\theta$  of  $22.1\pm0.4$ ;  $27.1\pm0.4$ ;  $28.1\pm0.4$ ;  $36\pm0.4$  y  $45.1\pm0.4$ .

According to a preferred prodn. method, the catalyst has empirical formula:  $\text{MoTe}_h\text{ViCu}_j\text{AkO}_x$ , wherein h, i, j, and k denote values of between 0.001 and 4 and x is dependent on the oxidn. state or the valency of elements Mo, Te, V, Cu and A.

IT 406681-66-1P, Copper molybdenum niobium tellurium vanadium oxide 491596-18-0P

(mixed metal oxide catalyst for the selective oxidn. and ammoxidn. of alkanes and/or alkenes to (meth)acrylic acid or acrylonitrile)

RN 406681-66-1 ZCAPLUS

CN Copper molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cu	x	7440-50-8
Nb	x	7440-03-1
Mo	x	7439-98-7

RN 491596-18-0 ZCAPLUS

CN Copper molybdenum tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cu	x	7440-50-8
Mo	x	7439-98-7

IT 406681-66-1P, Copper molybdenum niobium tellurium vanadium oxide 491596-18-0P

(mixed metal oxide catalyst for the selective oxidn. and

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
JP 2002371029	A2	20021226	JP 2001-179799	20010614
PRIORITY APPLN. INFO.:			JP 2001-179799	20010614

AB In manuf. of methacrylic acid (I) by passing material gases contg. methacrolein (II) 3-9, O 5-15, and H<sub>2</sub>O vapor 5-50 vol.% through a catalyst layer of a fixed-bed tubular reactor, gases contg. O, N, H<sub>2</sub>O, and 0-0.5 vol.% II are passed through the catalyst layer before the material gases and heated to 250-350°, then gases contg. II 1-2.8, O 5-15, and H<sub>2</sub>O 5-50 vol.% are passed at 250-350° for  $\geq 1$  h. Thus, supplying gases contg. O 9, H<sub>2</sub>O 10, and N 81 vol.% to a reactor filled with a catalyst (mixed oxide of at. ratio excluding O of Mo<sub>12</sub>P<sub>1.5</sub>Cu<sub>0.3</sub>V<sub>0.5</sub>Fe<sub>0.4</sub>Te<sub>0.1</sub>Mg<sub>0.15</sub>Zn<sub>0.1</sub>Cs) and Al<sub>2</sub>O<sub>3</sub> spheres at 290°, further supplying II 2, O 8, H<sub>2</sub>O 15, and N 75 vol.% to the reactor at 290° for 3 h, and further

supplying II 6.5, O 11, H<sub>2</sub>O 10, and N 72.5 vol.% at 290° gave 70.8% I with 83.3% selectivity, when a hot spot was obsd. with  $\Delta T$  24°.

IT 175161-19-0P, Cesium copper iron magnesium molybdenum phosphorus tellurium vanadium zinc oxide  
(manuf. of methacrylic acid by gas-phase catalytic oxidn. of methacrolein controlling hot spot temp.)

RN 175161-19-0 ZCAPLUS

CN Cesium copper iron magnesium molybdenum phosphorus tellurium vanadium zinc oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
Zn	x	7440-66-6
V	x	7440-62-2
Cu	x	7440-50-8
Cs	x	7440-46-2
Mo	x	7439-98-7
Mg	x	7439-95-4
Fe	x	7439-89-6

IT 175161-19-0P, Cesium copper iron magnesium molybdenum phosphorus tellurium vanadium zinc oxide  
(manuf. of methacrylic acid by gas-phase catalytic oxidn. of methacrolein controlling hot spot temp.)

L16 ANSWER 7 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:918230 ZCAPLUS

DOCUMENT NUMBER: 137:385204

TITLE: Gas-phase catalytic oxidation, and manufacture of unsaturated aldehydes and carboxylic acids using it

INVENTOR(S): Okita, Motomu; Watanabe, Seigo; Sato, Toshihiro

PATENT ASSIGNEE(S): Mitsubishi Rayon Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese



FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002348258	A2	20021204	JP 2001-157029	20010525

PRIORITY APPLN. INFO.:

JP 2001-157029

20010525

AB The oxidn. is carried out using fixed-bed reactors filled with (a) metals treated with mol. O-contg. gas at  $\geq 100^\circ$  and (b) oxidn. catalysts. Thus, a gas mixt. comprising isobutylene, O, H<sub>2</sub>O, and N was introduced into a reactor contg. SUS 304 Rasching ring (heat treated at  $400^\circ$ ) and Mo<sub>12</sub>W<sub>0.2</sub>Bi<sub>0.6</sub>Fe<sub>2.4</sub>Sb<sub>0.7</sub>Ni<sub>1.5</sub>Co<sub>6.1</sub>Mg<sub>1.0</sub>Cs<sub>0.5</sub>Si<sub>6.0</sub> oxide at  $340^\circ$  to give 88.7% 87.5:3.9 methacrolein and methacrylic acid.

IT 175161-19-0, Cesium copper iron magnesium molybdenum phosphorus tellurium vanadium zinc oxide  
(manuf. of unsatd. aldehydes and carboxylic acids by gas-phase catalytic oxidn. using fixed-bed reactors)

RN 175161-19-0 ZCAPLUS

CN Cesium copper iron magnesium molybdenum phosphorus tellurium vanadium zinc oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
Zn	x	7440-66-6
V	x	7440-62-2
Cu	x	7440-50-8
Cs	x	7440-46-2
Mo	x	7439-98-7
Mg	x	7439-95-4
Fe	x	7439-89-6

IT 175161-19-0, Cesium copper iron magnesium molybdenum  
phosphorus tellurium vanadium zinc oxide  
(manuf. of unsatd. aldehydes and carboxylic acids by gas-phase  
catalytic oxidn. using fixed-bed reactors)

L16 ANSWER 8 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:504741 ZCAPLUS

DOCUMENT NUMBER: 137:47915

TITLE: Preparation of methacrylic acid by gas-phase  
contact oxidation of methacrolein

INVENTOR(S): Watanabe, Seigo; Ohkita, Motomu

PATENT ASSIGNEE(S): Mitsubishi Rayon Co., Ltd., Japan

SOURCE: PCT Int. Appl., 16 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2002051787	A1	20020704	WO 2001-JP11117	200112 19
W: CN, US JP 2002193871	A2	20020710	JP 2000-392997	200012 25
US 2004073062	A1	20040415	US 2003-450712	200311 05
US 6930201	B2	20050816		
PRIORITY APPLN. INFO.:			JP 2000-392997	A 200012 25
			WO 2001-JP11117	W 200112 19

AB Methacrylic acid is prepd. by passing a feed gas contg.

methacrolein, oxygen and water vapor through a reactor packed with a catalyst comprising composite oxide contg. molybdenum and phosphorus as the main component (such as oxide of  $\text{Mo}_{12}\text{P}_{1.5}\text{Cu}_{0.3}\text{V}_{0.5}\text{Fe}_{0.4}\text{Te}_{0.1}\text{Mg}_{0.15}\text{Zn}_{0.1}\text{Cs}_1$ ), wherein the methacrolein concn. in the feed gas is 4-6.5 vol.%, molar ratio of water vapor to methacrolein in the feed gas is 1-2 and space velocity of the feed gas in the catalyst layer is 500-750 h<sup>-1</sup>. In the method deterioration of the catalyst is effectively inhibited.

IT 175161-19-0

(prepn. of methacrylic acid by gas-phase contact oxidn. of methacrolein)

RN 175161-19-0 ZCAPLUS

CN Cesium copper iron magnesium molybdenum phosphorus tellurium vanadium zinc oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
Zn	x	7440-66-6
V	x	7440-62-2
Cu	x	7440-50-8
Cs	x	7440-46-2
Mo	x	7439-98-7
Mg	x	7439-95-4
Fe	x	7439-89-6

IT 175161-19-0

(prepn. of methacrylic acid by gas-phase contact oxidn. of methacrolein)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L16 ANSWER 9 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:252972 ZCAPLUS

DOCUMENT NUMBER: 136:279833

TITLE: Promoted multi-metal oxide oxidation or ammoxidation catalysts

INVENTOR(S): Chaturvedi, Sanjay; Gaffney, Anne Mae; Han,

PATENT ASSIGNEE(S): Scott; Le, Hung Nhu Dominique; Song, Ruozhi;  
 SOURCE: Heffner, Michele Doreen; Vickery, Elsie Mae  
 Rohm and Haas Company, USA  
 Eur. Pat. Appl., 24 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 1192987	A1	20020403	EP 2001-308131	200109 25
EP 1192987	B1	20060802		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
US 2002065431	A1	20020530	US 2001-928197	200108 10
US 6407280	B1	20020618		
BR 2001004285	A	20020507	BR 2001-4285	200109 27
CN 1347756	A	20020508	CN 2001-140941	200109 27
JP 2002177784	A2	20020625	JP 2001-300840	200109 28
US 6504053	B1	20030107	US 2002-144924	200205 14
PRIORITY APPLN. INFO.:			US 2000-235979P	P 200009 28
			US 2000-235984P	P 200009 28

US 2000-236000P	P	200009 28
US 2000-236130P	P	200009 28
US 2001-286219P	P	200104 25
US 2001-928197	A	200108 10

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidn. of an alkane or a mixt. of an alkane and an alkene to an unsatd. carboxylic acid and for the vapor phase ammoxidn. of an alkane or a mixt. of an alkane and an alkene to an unsatd. nitrile. The multi-metal oxide catalyst comprises at least one element selected from the group consisting of Ni, Pd, Cu, Ag and Au.

IT 406681-66-1P

(promoted multi-metal oxide oxidn. or ammoxidn. catalysts for prepn. of carboxylic acids or nitriles from alkanes and/or alkenes)

RN 406681-66-1 ZCAPLUS

CN Copper molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cu	x	7440-50-8
Nb	x	7440-03-1
Mo	x	7439-98-7

IT 406681-66-1P

(promoted multi-metal oxide oxidn. or ammoxidn. catalysts for  
prepn. of carboxylic acids or nitriles from alkanes and/or  
alkenes)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L16 ANSWER 10 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:444517 ZCAPLUS

DOCUMENT NUMBER: 135:45942

TITLE: Preparation of nitriles using urea

INVENTOR(S): Oshima, Kazunori

PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2001163848	A2	20010619	JP 1999-346728	199912 06
			JP 1999-346728	199912 06

PRIORITY APPLN. INFO.:

OTHER SOURCE(S): CASREACT 135:45942

AB Nitriles are prepd. by gas-phase catalytic (oxidn.) reaction of org.  
comps. with urea using solid catalysts. Propylene, urea, air, and  
H2O were passed through Mo<sub>8.25</sub>W<sub>3.75</sub>Bi<sub>3</sub>Pb<sub>7.5</sub>Sb<sub>2.62</sub>O<sub>x</sub> at 440°  
to give 70.1% acrylonitrile.

IT 344591-58-8

(catalyst; prepn. of nitriles by gas-phase catalytic reaction of  
org. comps. and urea)

RN 344591-58-8 ZCAPLUS

CN Antimony copper iron molybdenum tellurium tungsten vanadium oxide  
(9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cu	x	7440-50-8
Sb	x	7440-36-0
W	x	7440-33-7
Mo	x	7439-98-7
Fe	x	7439-89-6

IT 344591-58-8

(catalyst; prepn. of nitriles by gas-phase catalytic reaction of  
org. compds. and urea)

L16 ANSWER 11 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:435018 ZCAPLUS

DOCUMENT NUMBER: 135:33731

TITLE: Method for producing methacrylic acid in high  
yield

INVENTOR(S): Watanabe, Seigo; Ohkita, Motomu

PATENT ASSIGNEE(S): Mitsubishi Rayon Co., Ltd., Japan

SOURCE: PCT Int. Appl., 15 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2001042184	A1	20010614	WO 2000-JP8637	200012 07
W: CN, JP, KR, SG, US				
US 2003004374	A1	20030102	US 2002-148171	200205 31
US 6969774	B2	20051129		

PRIORITY APPLN. INFO.:

JP 1999-351263

A

199912  
10

WO 2000-JP8637

W

200012  
07

AB A gas contg. methacrolein and O is passed through a solid oxidn. catalyst layer in a fixed bed tubular reactor having a heating medium bath to prep. methacrylic acid, and the catalyst layer has no area exhibiting temp. difference ( $\Delta T$ )  $35^\circ$  from the heating medium bath and  $\geq 2$  areas exhibiting  $\Delta T$   $15^\circ$ - $35^\circ$ . Thus, an oxide of  $\text{Mo}_{12}\text{P}_1.5\text{Cu}_{0.3}\text{V}_{0.5}\text{Fe}_{0.4}\text{Te}_{0.1}\text{Mg}_{0.15}\text{Zn}_{0.1}\text{Cs}_1$  was used as a catalyst.

IT 175161-19-0P

(oxidn. of methacrolein in fixed bed tubular reactor for manuf. of methacrylic acid in high yield)

RN 175161-19-0 ZCAPLUS

CN Cesium copper iron magnesium molybdenum phosphorus tellurium vanadium zinc oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
Zn	x	7440-66-6
V	x	7440-62-2
Cu	x	7440-50-8
Cs	x	7440-46-2
Mo	x	7439-98-7
Mg	x	7439-95-4
Fe	x	7439-89-6

IT 175161-19-0P

(oxidn. of methacrolein in fixed bed tubular reactor for manuf. of methacrylic acid in high yield)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT



L16 ANSWER 12 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:873229 ZCAPLUS

DOCUMENT NUMBER: 134:29784

TITLE: Molybdenum-containing catalysts for methacrylic acid preparation and preparation method of methacrylic acid therewith

INVENTOR(S): Watanabe, Seigo; Ohkita, Motomu

PATENT ASSIGNEE(S): Mitsubishi Rayon Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2000342974	A2	20001212	JP 1999-160164	19990607
JP 3690939	B2	20050831		
PRIORITY APPLN. INFO.:			JP 1999-160164	19990607

AB Title catalysts are prepd. by (i) crushing primary molded products of dried powders obtained from Mo-contg. mixt. solns. or aq. slurries and (ii) baking secondary molded products of the crushed primary molded products at 300-500°. Thus, a catalyst aq. soln. comprising ammonium paramolybdate 100, ammonium metavanadate 4.4, potassium nitrate 4.8, 85 vol.% phosphoric acid 8.2, copper nitrate 1.1, bismuth nitrate 6.9, 60 vol.% nitric acid 7.0, 60 vol.% arsenic acid 2.2, antimony trioxide 2.1, and cerium dioxide 1.6 parts was evapd. to dryness, dried at 130° for 16 h giving a dried block, and crushed to <1 mm to give dried powders. The dried powders (100 parts) were mixed with 2 parts graphite, molded to give a ring, which was crushed to <2 mm, 40 parts of which was mixed with 60 parts remained dried powders, 1 parts graphite was added, molded to give a ring, and baked at 380° for 5 h to give a catalyst Mo<sub>12</sub>P<sub>1.5</sub>V<sub>0.8</sub>Cu<sub>0.1</sub>Sb<sub>0.3</sub>As<sub>0.2</sub>Ce<sub>0.2</sub>K<sub>10</sub>Ox showing methacrolein reaction

rate 91.4%, methacrylic acid selectivity 88.6%, and methacrylic acid yield 81.0% at 290° for 3.6 s.

IT 175161-19-0P

(Mo-contg. catalysts for methacrylic acid prepn.)

RN 175161-19-0 ZCAPLUS

CN Cesium copper iron magnesium molybdenum phosphorus tellurium  
vanadium zinc oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
Zn	x	7440-66-6
V	x	7440-62-2
Cu	x	7440-50-8
Cs	x	7440-46-2
Mo	x	7439-98-7
Mg	x	7439-95-4
Fe	x	7439-89-6

IT 175161-19-0P

(Mo-contg. catalysts for methacrylic acid prepn.)

L16 ANSWER 13 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:470384 ZCAPLUS

DOCUMENT NUMBER: 133:89957

TITLE: Manufacture of methacrylic acid by gas phase  
oxidation of methacrolein

INVENTOR(S): Watanabe, Seigo; Okita, Motomu

PATENT ASSIGNEE(S): Mitsubishi Rayon Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2000191582 A2 20000711 JP 1998-370504

199812  
25JP 3486565 B2 20040113  
PRIORITY APPLN. INFO.: JP 1998-370504199812  
25

AB The process with high yield comprises passing a reaction gas contg. methacrolein (MAC), mol. O, and steam through a reactor filled with Mo, P, and V-based composite oxide catalyst, where the reaction gas contains MAC  $\geq 3$ , O  $\geq 5$  and steam  $\geq 5$  vol%; the reaction temp. when reaches less than 295° is adjusted to continue the reaction with the variation of catalyst reactivity; and a gas contg. MAC  $\geq 3$ , O  $\geq 5$  and steam  $\leq 2$  vol% is used to activate the catalyst before the reaction temp. reaches over 295°. Passing MAC 6, O 11, and steam (regular feed) at 290° through a reactor contg. Mo<sub>12</sub>P<sub>1.5</sub>V<sub>0.5</sub>Fe<sub>0.3</sub>Cu<sub>0.3</sub>Sb<sub>0.5</sub>K<sub>1</sub>Te 0.50x (x = O no.) at 290° resulted in methacrylic acid (MMA) with 76.2% yield. Passing the regular gas feed at 292° through the same reactor after 1500 h interval resulted MMA with 76.5% yield. Activating the catalyst with a gas contg. MAC 8.6, O 15.7, steam  $\leq 0.1$ , and N 75.7 vol% at 292° for 12 and contacting the catalyst with the regular gas feed resulted in MMA with yield 76.2%.

IT 155553-93-8P

(manuf. of methacrylic acid by gas phase oxidn. of methacrolein)

RN 155553-93-8 ZCAPLUS

CN Antimony copper iron molybdenum phosphorus potassium tellurium  
vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Sb	x	7440-36-0
K	x	7440-09-7
Mo	x	7439-98-7



acid)

RN 239089-64-6 ZCAPLUS

CN Antimony cobalt copper iron molybdenum niobium phosphorus potassium  
tellurium thallium tungsten vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Co	x	7440-48-4
Sb	x	7440-36-0
W	x	7440-33-7
Tl	x	7440-28-0
K	x	7440-09-7
Nb	x	7440-03-1
Mo	x	7439-98-7
Fe	x	7439-89-6

IT 239089-64-6P

(metal oxide catalysts for oxidn. of methacrolein to methacrylic  
acid)

L16 ANSWER 15 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1999:417790 ZCAPLUS

DOCUMENT NUMBER: 131:74087

TITLE: Oxide catalysts and manufacture of methacrylic  
acid using them

INVENTOR(S): Nagata, Yuichiro; Watanabe, Seigo; Okita, Motomu

PATENT ASSIGNEE(S): Mitsubishi Rayon Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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 JP 11179209                      A2            19990706            JP 1997-358303

199712  
25

JP 3370589                      B2            20030127  
 PRIORITY APPLN. INFO.:                      JP 1997-358303

199712  
25

AB    Methacrylic acid (I) is manufd. by gas-phase oxidn. of methacrolein (II) using Mo-, P-, Cu- V-, and Fe-contg. catalysts chosen from MoaPbCucVdFeeZnfBagXxYyOo (X = Na, K, Rb, Cs, Tl; Y = Mg, Ca, Sr, Ti, Zr, Nb, W, Ag, B, Si, Pb, As, Bi, S, Se, Te, La, Ce; if a = 12, then b = 0.1-3, c = 0.01-2, d = 0.01-3, e = 0.01-3, f = 0.01-2, g = 0.01-2, x = 0-3, y = 0-3), MoaPbCucVdFeeCohXxYyOo [X, Y, a, b, c, d, e, x, y = same as above; h = 0.01-2 (if a = 12)], and MoaPbCucVdFeeMniNijXxYyOo [X, Y, a, b, c, d, e, x, y = same as above; i = 0.01-2 (if a = 12); j = 0.01-2 (if a = 12)]. Thus, ammonium paramolybdate, Fe nitrate, H3PO4, arsenic acid, Cu nitrate, ammonium metavanadate, Zn(NO3)2, Ba(NO3)2, and CsNO3 were mixed in H2O, dried, and heated at 380° to give Mo12P1Cu0.2V0.6Fe0.2Zn0.2Ba0.1Cs0.8As0.2Oo. A mixt. of II, O, H2O, and N was passed through the catalyst at 270° and contact time 3.6 s to result in II conversion 89.6% and I selectivity 89.2%.

IT    229012-39-9P 229012-51-5P 229012-82-2P

(mixed oxide catalysts for manuf. of methacrylic acid by oxidn. of methacrolein)

RN    229012-39-9    ZCAPLUS

CN    Barium copper iron molybdenum phosphorus rubidium tellurium vanadium zinc oxide (9CI)    (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
Zn	x	7440-66-6
V	x	7440-62-2
Cu	x	7440-50-8
Ba	x	7440-39-3
Rb	x	7440-17-7

Mo	x	7439-98-7
Fe	x	7439-89-6

RN 229012-51-5 ZCAPLUS

CN Cesium cobalt copper iron molybdenum phosphorus tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Co	x	7440-48-4
Cs	x	7440-46-2
Mo	x	7439-98-7
Fe	x	7439-89-6

RN 229012-82-2 ZCAPLUS

CN Cesium copper iron manganese molybdenum nickel phosphorus tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Cs	x	7440-46-2
Ni	x	7440-02-0
Mo	x	7439-98-7
Mn	x	7439-96-5
Fe	x	7439-89-6

IT 229012-39-9P 229012-51-5P 229012-82-2P

(mixed oxide catalysts for manuf. of methacrylic acid by oxidn. of methacrolein)

L16 ANSWER 16 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1999:97238 ZCAPLUS

DOCUMENT NUMBER: 130:182875

TITLE: Molybdenum-containing composite oxide catalysts  
for manufacture of methacrylic acid, their  
manufacture, and manufacture of methacrylic acid  
using them

INVENTOR(S): Kondo, Masahide; Kuroda, Toru

PATENT ASSIGNEE(S): Mitsubishi Rayon Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 11033404	A2	19990209	JP 1997-191224	199707 16
JP 3764805	B2	20060412		
PRIORITY APPLN. INFO.:			JP 1997-191224	199707 16

AB Title catalysts  $\text{PaMo}_b\text{VcCu}_d\text{XeYfZgOh}$  ( $X = \text{As, Sb, Bi, Ge, Zr, Te, Se, Si, W, B, and/or Ag}$ ;  $Y = \text{Fe, Zn, Cr, Mg, Ta, Mn, Co, Ba, Ga, Ce, and/or La}$ ;  $Z = \text{K, Rb, Cs, and/or Tl}$ ;  $a = 0.5-3$ ,  $c, g = 0.01-3$ ,  $d = 0-2$ , and  $e, f = 0-3$  if  $b = 12$ ) are manufd. by mixing raw materials in the presence of  $0.01-3$  mol (for  $12$  mol Mo) hydrazines and heating. Methacrylic acid (I) is manufd. by vapor-phase contact oxidn. of methacrolein (II) with mol. O using the catalysts. Thus, II was oxidized using  $\text{P1.5Mo12V0.3Cu0.1Sb0.6KOh}$  prepd. using hydrazine hydrate to give I with yield  $81.0\%$  and selectivity  $82.0\%$ .

IT 149661-88-1P, Copper iron magnesium molybdenum phosphorus  
rubidium tellurium vanadium oxide

(manuf. of Mo-contg. composite oxide catalysts with hydrazines  
for manuf. of methacrylic acid)

RN 149661-88-1 ZCAPLUS

CN Copper iron magnesium molybdenum phosphorus rubidium tellurium



vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Rb	x	7440-17-7
Mo	x	7439-98-7
Mg	x	7439-95-4
Fe	x	7439-89-6

IT 149661-88-1P, Copper iron magnesium molybdenum phosphorus  
rubidium tellurium vanadium oxide  
(manuf. of Mo-contg. composite oxide catalysts with hydrazines  
for manuf. of methacrylic acid)

L16 ANSWER 17 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1998:599806 ZCAPLUS

DOCUMENT NUMBER: 129:276501

TITLE: Preparation of catalysts for high-yield  
methacrylic acid productionINVENTOR(S): Naito, Hiroyuki; Matsumoto, Satoshi; Kuroda,  
Toru

PATENT ASSIGNEE(S): Mitsubishi Rayon Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 10244160	A2	19980914	JP 1997-49130	

199703  
04

PRIORITY APPLN. INFO.:

JP 1997-49130

199703

04

AB Title catalysts PaMobVcCudXeYfZgOh (X = Sb, Bi, As, Ge, Zr, Te, Ag, Se, Si, W, B; Y = Fe, Zn, Cr, Mg, Ta, Co, Mn, Ba, Ga, Ce, La; Z = K, Rb, Cs, Tl; a, b, c, d, e, f, g, h = at. ratio of each element; b = 12, then a = 0.5-3, c, g = 0.01-3, d = 0-2, e, f = 0-3; h = necessary no. to satisfy valence of each component) for manuf. of methacrylic acid (I) by vapor-phase oxidn. of methacrolein are prepd. by mixing carbonic acid compd. powders [av. particle diam. (.vphi.) 0.1-100  $\mu$ m] with dry powders of catalyst precursors, shaping, and heat treating them. Thus, a slurry contg. MoO<sub>3</sub> 100, NH<sub>4</sub>VO<sub>3</sub> 4.06, H<sub>3</sub>PO<sub>4</sub> 8.68, Cu nitrate 2.80, and CsHCO<sub>3</sub> 11.3 was dried at 350° to give a catalyst precursor, 100 parts of which was mixed with 10 parts (NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub> (.vphi. 20  $\mu$ m), shaped, and heat treated at 380° for 3 h to give a catalyst, which was used for prepn. of I showing reaction rate 84.0%, selectivity 85.6%, and yield 71.9%.

IT 149661-88-1P

(prepn. of catalysts for vapor-phase oxidn. of methacrolein for methacrylic acid prodn.)

RN 149661-88-1 ZCAPLUS

CN Copper iron magnesium molybdenum phosphorus rubidium tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Rb	x	7440-17-7
Mo	x	7439-98-7
Mg	x	7439-95-4
Fe	x	7439-89-6

IT 149661-88-1P

(prepn. of catalysts for vapor-phase oxidn. of methacrolein for methacrylic acid prodn.)

L16 ANSWER 18 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1996:211825 ZCAPLUS

DOCUMENT NUMBER: 124:235530

TITLE: Manufacture of catalysts of gas-phase oxidation  
of unsaturated aldehydes

INVENTOR(S): Naito, Hiroyuki; Mori, Kunio

PATENT ASSIGNEE(S): Mitsubishi Rayon Co, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 08010621	A2	19960116	JP 1994-145048	199406 27
PRIORITY APPLN. INFO.:			JP 1994-145048	199406 27

AB The catalysts useful for prepg. unsatd. carboxylic acids in high yield are manufd. by drying a mixed soln. or aq. slurry contg. Mo and V components and shaping the dried products to particles with diam. 1-250  $\mu$ m. Adding sequentially a soln. of 85% H<sub>3</sub>PO<sub>4</sub> 7.6 and water 10, a soln. of Cu nitrate 1.1 and water 10, and a soln. of Bi nitrate 4.6, 60% HNO<sub>3</sub> 4.7, and water 40 parts to a stirred soln. contg. NH<sub>4</sub> paramolybdate 100, NH<sub>4</sub> metavanadate, K nitrate 4.8, and water 400 parts, heating at 95° while adding a soln. of 60% arsenic acid 2.2, water 10 and Sb<sub>2</sub>O<sub>3</sub> 2.1 part, and spray drying at 270° and 6000 rpm gave particles with diam. 5-150  $\mu$ m. Mixing the particles with MeOH, shaping in an extruder to 6-mm rings, drying, and calcining gave a mixed oxide, which was used for oxidn. of methacrolein to methacrylic acid with 88.3% selectivity and 79.2% yield.

IT 175161-19-0P

(manuf. of catalysts of gas-phase oxidn. of unsatd. aldehydes)

RN 175161-19-0 ZCAPLUS

CN Cesium copper iron magnesium molybdenum phosphorus tellurium

vanadium zinc oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
Zn	x	7440-66-6
V	x	7440-62-2
Cu	x	7440-50-8
Cs	x	7440-46-2
Mo	x	7439-98-7
Mg	x	7439-95-4
Fe	x	7439-89-6

IT 175161-19-0P

(manuf. of catalysts of gas-phase oxidn. of unsatd. aldehydes)

L16 ANSWER 19 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1996:73213 ZCAPLUS

DOCUMENT NUMBER: 124:120767

TITLE: Manufacture of molybdenum and vanadium  
oxide-based oxidation catalysts for preparing  
unsaturated carboxylic acids

INVENTOR(S): Kuroda, Tooru; Shiotani, Tooru

PATENT ASSIGNEE(S): Mitsubishi Rayon Co, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 07299369	A2	19951114	JP 1994-97729	199405 11
PRIORITY APPLN. INFO.:				JP 1994-97729 199405

11

AB The catalysts useful for gas phase oxidn. of unsatd. aldehydes are manufd. by treating a mixed soln. or aq. slurry contg. Mo and V compds. with ultrasonic waves at  $\geq 16,000$  Hz, drying and then heat treatment. Prepg. a mixed oxide of P, Mo, V, Sb, Cu, and K and oxidizing a mixed gas of methacrolein, O, steam and N using the oxide gave methacrylic acid with conversion 81.3% and selectivity 81.0%.

IT 149661-88-1P

(manuf. of molybdenum and vanadium oxide-based oxidn. catalysts for prepg. unsatd. carboxylic acids)

RN 149661-88-1 ZCAPLUS

CN Copper iron magnesium molybdenum phosphorus rubidium tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Rb	x	7440-17-7
Mo	x	7439-98-7
Mg	x	7439-95-4
Fe	x	7439-89-6

IT 149661-88-1P

(manuf. of molybdenum and vanadium oxide-based oxidn. catalysts for prepg. unsatd. carboxylic acids)

L16 ANSWER 20 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1995:661134 ZCAPLUS

DOCUMENT NUMBER: 123:231968

TITLE: Method of preparing catalyst used for producing methacrylic acids

INVENTOR(S): Kuroda, Toru; Oh-Kita, Motomu

PATENT ASSIGNEE(S): Mitsubishi Rayon Co., Ltd., Japan

SOURCE: U.S., 4 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5420091	A	19950530	US 1993-90278	19930713
JP 05192580	A2	19930803	JP 1992-9438	19920122
JP 3209778	B2	20010917	JP 1992-9438	19920122

PRIORITY APPLN. INFO.: A

AB The catalyst is represented by  $\text{PaMobVcGedXeYfZgOh}$ , wherein P, Mo, V, Ge and O represent phosphorous, molybdenum, vanadium, germanium and oxygen, resp.; X represents  $\geq 1$  element selected from As, Sb, Bi, Zr, Te, Ag and B; Y represents  $\geq 1$  element selected from Fe, Cu, Zn, Cr, Mg, Ta, Mn, Ba, Ga, Ce and La; Z represents  $\geq 1$  element selected from K, Rb, Cs and Tl, and a, b, c, d, e, f, g and h represent the at. ratios of the resp. elements, and when  $b = 12$ , then  $a = 0.5-3$ ,  $c = 0.01-3$ ,  $d = 0.01-3$ ,  $e = 0-3$ ,  $f = 0-3$ ,  $g = 0.01-3$ , and h is the no. of oxygen atoms necessary for satisfying the above at. ratios of the resp. components. The method includes providing an aq. mixt. contg. at least P, Mo, V, Ge, X, Y and Z and removing water from the aq. mixt., where the improvement comprises providing at least part of the Ge for the aq. mixt. by dissolving germanium dioxide in an aq. soln. of a hydroxide of an element represented by Z in the above formula. The catalyst prepd. according to the method is remarkably elevated in activity in the methacrolein oxidn. reaction and allows enhancement of the yield of methacrylic acid.

IT 168617-83-2

(prepn. of oxidn. catalyst for producing methacrylic acid)

RN 168617-83-2 ZCAPLUS

CN Copper germanium iron molybdenum phosphorus potassium rubidium tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Ge	x	7440-56-4
Cu	x	7440-50-8
Rb	x	7440-17-7
K	x	7440-09-7
Mo	x	7439-98-7
Fe	x	7439-89-6

IT 168617-83-2

(prepn. of oxidn. catalyst for producing methacrylic acid)

L16 ANSWER 21 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1995:374734 ZCAPLUS

DOCUMENT NUMBER: 122:134129

TITLE: Manufacture of acrolein or acrylic acid and catalyst therefor

INVENTOR(S): Jinbo, Takashi; Kogure, Yasuo; Io, Hirobumi; Muraguchi, Takashi; O. Kinkai

PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 06218286	A2	19940809	JP 1992-340143	19921221
JP 3328340	B2	20020924		
PRIORITY APPLN. INFO.:			JP 1992-323438	A 199212

02

AB The process comprises oxidn. of C<sub>3</sub>H<sub>8</sub> with mol. O using a heteropoly acid or salt contg. P and Mo as essential components. A composite oxide catalyst contg. P, Mo, V, As, Cu, and Cs at at. ratio 1.4:12:1.2:0.22:0.24:0.2 was prepd. and used for oxidn. of C<sub>3</sub>H<sub>8</sub> to give acrylic acid with selectivity 2.56% at C<sub>3</sub>H<sub>8</sub> conversion 16.5%.

IT 161173-63-3

(oxidn. catalyst for manuf. of acrolein or acrylic acid)

RN 161173-63-3 ZCAPLUS

CN Barium cerium copper iron molybdenum phosphorus potassium silver tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Ce	x	7440-45-1
Ba	x	7440-39-3
Ag	x	7440-22-4
K	x	7440-09-7
Mo	x	7439-98-7
Fe	x	7439-89-6

IT 161173-63-3

(oxidn. catalyst for manuf. of acrolein or acrylic acid)

L16 ANSWER 22 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1994:436411 ZCAPLUS

DOCUMENT NUMBER: 121:36411

TITLE: Catalysts for manufacture of methacrylic acid by the gas-phase oxidation of methacrolein

INVENTOR(S): Ubuki, Masako; Kinoshita, Yutaka; Ookita, Motomu

PATENT ASSIGNEE(S): Mitsubishi Rayon Co, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese



FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 05279291	A2	19931026	JP 1992-81032	19920402

PRIORITY APPLN. INFO.:

JP 1992-81032

19920402

AB The title catalysts contain P, Mo, V, and Cu, and other elements and are baked at 350-395° with gas contg. 0.1-10 vol% O before use. Thus, dissolving ammonium paramolybdate 100, ammonium metavanadate 2.6, and CsNO<sub>3</sub> 9.2 in water 100, adding 85% H<sub>3</sub>PO<sub>4</sub> 8.7 in water 30, adding Cu nitrate 1.1 in water 30 parts, heating with stirring until the mixt. dried, heating the solids at 130° for 16 h, press-molding, and baking 3 h with a 1:99 (vol/vol) mixt. of O and N at 380° gave a catalyst. Oxidn. of methacrolein 5 by O 10 in water vapor 30 and N 55 vol% in the presence of the catalyst at 290° for 3.6 s gave methacrylic acid at conversion 82.2% and selectivity 83.0%.

IT 156014-95-8

(catalysts, ceramic, for oxidn. of methacrolein to methacrylic acid)

RN 156014-95-8 ZCAPLUS

CN Cesium copper iron magnesium molybdenum phosphorus potassium tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Cs	x	7440-46-2
K	x	7440-09-7
Mo	x	7439-98-7

Mg		x		7439-95-4
Fe		x		7439-89-6

IT 156014-95-8

(catalysts, ceramic, for oxidn. of methacrolein to methacrylic acid)

L16 ANSWER 23 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1994:332316 ZCAPLUS

DOCUMENT NUMBER: 120:332316

TITLE: Regeneration of oxidation catalyst for manufacturing methacrylic acid from methacrolein

INVENTOR(S): Ookita, Motomu; Kinoshita, Yutaka

PATENT ASSIGNEE(S): Mitsubishi Rayon Co, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 06007685	A2	19940118	JP 1992-167737	19920625
JP 3282849	B2	20020520		
PRIORITY APPLN. INFO.:			JP 1992-167737	19920625

AB The title method involved placing a catalyst contg. at least P, Mo, and V in a reactor and heating at 300-410° for 0.5-50 h while passing an oxidizing gas contg. O  $\geq$  0.1 vol.%. Optimally, NH<sub>4</sub>NO<sub>3</sub>, (NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub>, or NH<sub>4</sub>HCO<sub>3</sub> may be added to the catalyst. The method is simple.

IT 155553-93-8P

(oxidn. catalyst, regeneration of, for manufg. methacrylic acid)

RN 155553-93-8 ZCAPLUS

CN Antimony copper iron molybdenum phosphorus potassium tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Sb	x	7440-36-0
K	x	7440-09-7
Mo	x	7439-98-7
Fe	x	7439-89-6

IT 155553-93-8P

(oxidn. catalyst, regeneration of, for manufg. methacrylic acid)

L16 ANSWER 24 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1993:518035 ZCAPLUS

DOCUMENT NUMBER: 119:118035

TITLE: Preparation of catalyst for producing  
methacrylic acid

INVENTOR(S): Kuroda, Toru; Ohkita, Motomu

PATENT ASSIGNEE(S): Mitsubishi Rayon Co., Ltd., Japan

SOURCE: PCT Int. Appl., 19 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 9222378	A1	19921223	WO 1992-JP747	199206 11
W: KR, US				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE				
JP 04367737	A2	19921221	JP 1991-140120	199106 12

JP 2814317 B2 19981022  
 EP 543019 A1 19930526 EP 1992-911109

199206  
 11

EP 543019 B1 19970903  
 R: DE, FR, GB, NL  
 US 5422326 A 19950606 US 1993-978698

199302  
 08

PRIORITY APPLN. INFO.:

JP 1991-140120 A

199106  
 12

WO 1992-JP747 W

199206  
 11

AB The title catalysts useful for manufg. methacrylic acid (I) by gas-phase oxidn. of methacrolein (II) are prepd. by molding PaMobVcXdYeZfOg (X = As, Sb, Ge, Bi, Zr, Te, Ag, B; Y = Fe, Cu, Zn, Cr, Mg, Ta, Mn, Ba, Ga, Ce, La; Z = K, Rb, Cs, Tl; a = 0.5-3, b = 12, c = 0.01-3, d, e = 0-3, f = 0.01-3) with polymers (av. diam. 0.01-10  $\mu$ m), then heat treatment of the moldings. Thus, molding 100 parts P1.5Mo12V0.3Sb0.4Cu0.1K oxide with 3 parts poly(Me methacrylate) (III) and heating at 380° for 5 h gave a catalyst, which was used in oxidn. of II at 270° to give I with selectivity 81.4%, and II conversion 80.3%, vs. 79.7 and 80.6, resp., for catalyst without molding with III.

IT 149661-88-1

(catalysts, for gas-phase oxidn. of methacrolein to methacrylic acid)

RN 149661-88-1 ZCAPLUS

CN Copper iron magnesium molybdenum phosphorus rubidium tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2

Cu		x		7440-50-8
Rb		x		7440-17-7
Mo		x		7439-98-7
Mg		x		7439-95-4
Fe		x		7439-89-6

IT 149661-88-1

(catalysts, for gas-phase oxidn. of methacrolein to methacrylic acid)

L16 ANSWER 25 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1989:534916 ZCAPLUS

DOCUMENT NUMBER: 111:134916

TITLE: Process for maintaining high level of yield of acrylonitrile and hydrogen cyanide in ammoxidation of propylene

INVENTOR(S): Sasaki, Yutaka; Kiyomia, Yutaka; Nakamura, Toshio; Mori, Kunio; Morii, Akimitsu

PATENT ASSIGNEE(S): Nitto Chemical Industry Co., Ltd., Japan

SOURCE: Eur. Pat. Appl., 19 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 311334	A1	19890412	EP 1988-309180	19881003
EP 311334	B1	19920311		
R: DE, ES, FR, GB, IT, NL				
JP 02000256	A2	19900105	JP 1988-184522	19880726
JP 05083539	B4	19931126		
ES 2030508	T3	19921101	ES 1988-309180	19881003
US 5160721	A	19921103	US 1988-253526	

198810  
05

PRIORITY APPLN. INFO.:

JP 1987-249707

A

198710  
05

JP 1988-184522

A

198807  
26

AB Process for prolonged ammoxidn. of C<sub>3</sub>H<sub>6</sub> to acrylonitrile (I) with high yield of product I and useful byproduct HCN involves catalysis by metal oxides and their regeneration using P or its compds. which are added when yield of I and HCN is declined, and Te or its compds. which are added when yield of I is declined. Ammoxidn. of C<sub>3</sub>H<sub>6</sub> using Fe<sub>12</sub>Cu<sub>3</sub>Sb<sub>25</sub>W<sub>0.5</sub>Te<sub>1.25</sub>O<sub>75</sub>(SiO<sub>2</sub>)<sub>60</sub> catalyst was maintained constantly over .apprx.30 h by supplying red P, then Te when sign of deactivation appeared.

IT 122809-86-3

(catalysts, for ammoxidn. of propylene to acrylonitrile,  
activator for)

RN 122809-86-3 ZCAPLUS

CN Antimony copper iron molybdenum tungsten vanadium oxide silicate tellurate (Sb<sub>20</sub>Cu<sub>3.2</sub>Fe<sub>10</sub>Mo<sub>0.6</sub>W<sub>0.1</sub>V<sub>0.2</sub>O<sub>2</sub>(SiO<sub>3</sub>)<sub>56</sub>(TeO<sub>4</sub>)<sub>1.4</sub>) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
O <sub>4</sub> Te	1.4	15845-23-5
O <sub>3</sub> Si	56	15593-90-5
V	0.2	7440-62-2
Cu	3.2	7440-50-8
Sb	20	7440-36-0
W	0.1	7440-33-7
Mo	0.6	7439-98-7
Fe	10	7439-89-6

IT 122809-86-3

(catalysts, for ammoxidn. of propylene to acrylonitrile,  
activator for)

L16 ANSWER 26 OF 26 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1989:153933 ZCAPLUS

DOCUMENT NUMBER: 110:153933

TITLE: Preparation of chlorobenzonitriles as intermediates for drugs and agrochemicals and dyes

INVENTOR(S): Kiyomiya, Yutaka; Sasaki, Tomu; Murata, Hiroshi; Yamaguchi, Masanori; Hoshino, Manabu; Yamaguchi, Yasumasa

PATENT ASSIGNEE(S): Nitto Chemical Industry Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 63250357	A2	19881018	JP 1987-84596	19870408
JP 06029231	B4	19940420		
PRIORITY APPLN. INFO.:			JP 1987-84596	19870408

AB The title compds. are prepd. by gas-phase catalytic ammoxidn. of Cl-contg. toluenes with NH<sub>3</sub> and O in the presence of FeaVbCrcSbdXeRfZgQhOi(SiO<sub>2</sub>)<sub>j</sub> [X = Co, Ni, Sn, U, Cu, Mn, Ti, Ce, Be, Mg, Ca, Sr, Ba, Y, La, Zr, Hf, Nb, Ta, Re, Ru, Os, Rh, Ir, Pd, Pt, Ag, Zn, Cd, Al, Ga, In, Ge, and/or Pb; R = Mo and/or W; Z = P, B, Bi, and/or Te; Q = Li, Na, K, Rb, Cs, and/or Tl; a:b:c:d:e:f:g:h:j = 10:(0.05-10):(0-25):(5-60):(0-10):(0-5):(0-5):(0-2):(20-200); i = no. to form appropriate oxide]. Aq. HNO<sub>3</sub> contg. Cu, Fe, and Te and an aq. soln. contg. ammonium tungstate and ammonium molybdate were mixed with silica sol and Sb<sub>2</sub>O<sub>3</sub>, then the resulting slurry was adjusted to pH 2.5 by Nh<sub>4</sub>OH, heated 5 h at 100°, dried, and calcined 3 h at 300° and 5 h at 800° to give a solid product. The product was immersed in an aq. soln. contg. V<sub>2</sub>O<sub>5</sub>,

oxalic acid, and  $\text{Cr}(\text{NO}_3)_3$  and calcined 4 h at  $200^\circ$  and 4 h at  $450^\circ$  to give  $\text{Fe}_{10}\text{V}_{1.5}\text{Cr}_3\text{Sb}_{20}\text{Cu}_3\text{Mo}_{0.5}\text{W}_{0.1}\text{Te}_{1.4}\text{Si}_{55}\text{O}_{178}$  (I). A 1:5:5 M mixt. of 2,6-dichlorotoluene,  $\text{NH}_3$ , and O was treated over I at  $360^\circ$  to give 2,6-dichlorobenzonitrile in 87% selectivity at 96% conversion, vs. 69% selectivity and 78% conversion using  $\text{Fe}_{10}\text{V}_2\text{Si}_{60}\text{O}_{140}$  as the catalyst.

IT 119855-51-5 119855-52-6 119883-94-2

(catalyst, for gas-phase ammoxidn. of chlorotoluenes)

RN 119855-51-5 ZCAPLUS

CN Antimony chromium copper iron molybdenum tungsten vanadium zinc borate oxide phosphate silicate tellurate  
( $\text{Sb}_{2.5}\text{Cr}_{0.3}\text{Cu}_{0.4}\text{FeMo}_{0.05}\text{W}_{0.02}\text{V}_{0.15}\text{Zn}_{0.05}(\text{BO}_3)_{0.05}\text{O}_{1.93}(\text{PO}_4)_{0.01}(\text{SiO}_3)_{5.5}(\text{TeO}_6)_{0.13}$ ) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O6Te	0.13	23325-05-5
O	1.93	17778-80-2
O3Si	5.5	15593-90-5
O4P	0.01	14265-44-2
BO3	0.05	14213-97-9
Zn	0.05	7440-66-6
V	0.15	7440-62-2
Cu	0.4	7440-50-8
Cr	0.3	7440-47-3
Sb	2.5	7440-36-0
W	0.02	7440-33-7
Mo	0.05	7439-98-7
Fe	1	7439-89-6

RN 119855-52-6 ZCAPLUS

CN Antimony chromium copper iron molybdenum tungsten vanadium oxide silicate tellurate ( $\text{Sb}_2\text{Cr}_{0.3}\text{Cu}_{0.3}\text{FeMo}_{0.05}\text{W}_{0.01}\text{V}_{0.15}\text{O}_{0.46}(\text{SiO}_3)_5.5(\text{TeO}_6)_{0.14}$ ) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O6Te	0.14	23325-05-5
O	0.46	17778-80-2
O3Si	5.5	15593-90-5



V	0.15	7440-62-2
Cu	0.3	7440-50-8
Cr	0.3	7440-47-3
Sb	2	7440-36-0
W	0.01	7440-33-7
Mo	0.05	7439-98-7
Fe	1	7439-89-6

RN 119883-94-2 ZCAPLUS

CN Antimony chromium copper iron molybdenum nickel tungsten vanadium  
oxide phosphate silicate tellurate (Sb<sub>2</sub>Cr<sub>0.8</sub>Cu<sub>0.25</sub>FeMo<sub>0.04</sub>Ni<sub>0.02</sub>W<sub>0.03</sub>V<sub>0.20</sub>2.7(PO<sub>4</sub>)0.01(SiO<sub>3</sub>)4.5(TeO<sub>6</sub>)0.11) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O6Te	0.11	23325-05-5
O	2.7	17778-80-2
O3Si	4.5	15593-90-5
O4P	0.01	14265-44-2
V	0.2	7440-62-2
Cu	0.25	7440-50-8
Cr	0.8	7440-47-3
Sb	2	7440-36-0
W	0.03	7440-33-7
Ni	0.02	7440-02-0
Mo	0.04	7439-98-7
Fe	1	7439-89-6

IT 119855-51-5 119855-52-6 119883-94-2

(catalyst, for gas-phase ammoxidn. of chlorotoluenes)

=> D L17 1-2 IBIB ABS HITSTR HITRN

L17 ANSWER 1 OF 2 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:801038 ZCAPLUS

DOCUMENT NUMBER: 141:295450

TITLE: Production method of catalyst for methacrylic  
acid synthesis

INVENTOR(S): Uda, Takashi; Naito, Hiroyuki

PATENT ASSIGNEE(S): Mitsubishi Rayon Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004268027	A2	20040930	JP 2004-35966	20040213
				20030217

PRIORITY APPLN. INFO.: JP 2003-38739 A

AB The invention refers to a catalyst for the vapor phase oxidn. of methacrolein to form methacrylic acid, PaMobVcCudXeYfZgOh [X = As, Sn or Te; Y = Bi, Ge, Zr, Ag, Se, Si, W, B, Fe, Zn, Cr, Mg, Ta, Co, Mn, Ba, Ca, Ce or La; Z = K, Rb, Cs; when b = 12, a = 0.5 - 3, c = 0.01 - 3, d = 0.01 - 2, e = 0.01 - 3, f = 0 - 3; g = 0.01 - 3; h = dependent on valence state of other elements].

IT 763118-66-7

(prodn. method of catalyst for methacrylic acid synthesis)

RN 763118-66-7 ZCAPLUS

CN Cesium copper manganese molybdenum phosphorus potassium tellurium vanadium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Te	x	13494-80-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Cs	x	7440-46-2
K	x	7440-09-7
Mo	x	7439-98-7
Mn	x	7439-96-5

IT 763118-66-7

(prodn. method of catalyst for methacrylic acid synthesis)

L17 ANSWER 2 OF 2 ZCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1967:61348 ZCAPLUS

DOCUMENT NUMBER: 66:61348

TITLE: Some telluro-vanadomolybdates

AUTHOR(S): Prasad, Sarju; Pathak, Keshawa C.

CORPORATE SOURCE: Hindu Univ., Banaras, Japan

SOURCE: Bulletin of the Chemical Society of Japan  
(1966), 39(12), 2666-8

CODEN: BCSJA8; ISSN: 0009-2673

DOCUMENT TYPE: Journal

LANGUAGE: English

AB 6(NH<sub>4</sub>)<sub>2</sub>O.TeO<sub>3</sub>.3V<sub>2</sub>O<sub>5</sub>.4MoO<sub>3</sub>.15H<sub>2</sub>O (I) was synthesized by refluxing a mixt. of telluric acid and ammonium metavanadate in an ammoniacal medium for 4 hrs., after which a molybdic acid soln. in NH<sub>4</sub>OH was added. This mixt. was refluxed for another 8 hrs. and then evapd. to a small bulk and kept in a refrigerator for crystn. I was obtained as a yellow cryst. substance highly sol. in H<sub>2</sub>O, and easily decompd. by acids and alkalies. Cu, Ag, Ca, Sr, Ba, and Pb salts have been prepd. from the ammonium salt, and the compn. of all detd. Ammonium and Sr salts were studied by D.T.A. The ir spectra of the ammonium salt and its dehydrated product have been recorded, and the characteristic frequencies assigned.

IT 12161-91-0P

(prepn. of)

RN 12161-91-0 ZCAPLUS

CN Copper molybdenum vanadium oxide tellurate (Cu<sub>6</sub>Mo<sub>4</sub>V<sub>6</sub>O<sub>30</sub>(TeO<sub>6</sub>)),  
hexahydrate (9CI) (CA INDEX NAME)

CM 1

CRN 164250-44-6

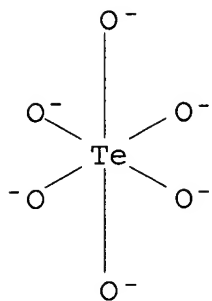
CMF Cu . Mo . O6 Te . O . V

CCI TIS

CM 2

CRN 23325-05-5

CMF O6 Te



CM 3

CRN 17778-80-2

CMF O

O

CM 4

CRN 7440-62-2

CMF V

V

CM 5

CRN 7440-50-8

CMF Cu

Cu

SACKEY 10/759,384

Page 52

CM 6

CRN 7439-98-7

CMF Mo

Mo

IT 12161-91-0P  
(prepn. of)